CHAPTER I
INTRODUCTION

1.1 Background

Today's generation is the generation of "digital natives", the students were raised in different ways (Prensky, 2001). Since early childhood, they have been immersed in the term technology which has significantly affected the way they gain information, develop knowledge, and acquire skills (Mokwa-Tarnowska, 2016). The educators should be aware of the characteristics of their students. From the characteristics of the students above, the teacher should be ready to embrace the technology in the process of teaching.

Biology is one of the subject that considered hard for students to learn. Various researchers around the world have been studied about the students' difficulty in learning biology (Bahar, Johnstone, & Hansell, 1999; Cimer, 2012; Lazarowitz & Penso, 1992; Prokop, Prokop, & Tunnicliffe, 2007). According to Cimer (2012), a large majority of students suggested that teacher should use visual materials in biology teaching to makes biology learning effective. Previous researcher also encourage teachers to use visual material such as image, poster, models, and computer in the classes that have been discovered to be effective in making lesson appealing and exciting for students (Mistler-Jackson & Butler Songer, 2000; Peat & Fernandez, 2000).

Students' concept mastery is important component of learning outcomes, including in learning science. It can represent cognitive skill of students as a result of learning process. The result of PISA (Programme for International Students Assessment) state that Indonesia students are still low in science achievement. Indonesia students got rank 62 from 70 countries that participated for science (Pisa, 2015). The objective of a poster is to foster interest and involvement in order to develop knowledge and practice within a given area (Rowe & Ilic, 2011). The cognitive skills' structure in Bloom Taxonomy, builds from the simple to advance. The level cognitive based on Bloom Taxonomy (Anderson et al., 2001); remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and Creating (C6).

Creativity is one of 21st century skills that important to develop at school as a place for students to get basic skills. Teacher should prepare their students and provided the generation with high creativity so that they can compete globally. At global level, Indonesian creativity included to the lowest. Indonesia got rank at 115 from 139 countries, with global creativity index 0.202, while Australia in the first rank got 0.970 global creativity index (Florida, Mellander, & King, 2015). Creativity is also essential for innovative scientific discoveries and applications (Cotantino, Kellam, Cramond, & Crowder, 2010). For the teacher, allowing learners to express their creativity is important.

In teaching activities, it is necessary to participate actively so that the students can learn better, because learning is not transmitting knowledge to students. On contrary, students are active individuals who shape their own learning. In this context, activity-based poster is one of the learning approaches which keep the students active in the classroom and enables them to learn meaningfully during lesson (Hess & Brooks, 1998). Poster is used as a visual aid to present any specific information in educational setting in a concise manner (Zerin & Khan, 2017). According to Rowe & Ilic (2011), posters are designed to visually represent an issue that attracts attention, and then transmits an intended message. Poster assignment can encourage learners to start organizing and understanding the information in different way, by creating poster that allows them to visualize the real phenomena and make them be more creative. Poster not only enable students to practice their critical-thinking and organizational skills, but it also promotes further growth of students oral and visual presentation abilities (Dorner, 2015).

The activity-based poster is suited for all levels. Poster based leaning also facilitate cooperative learning, gives students the chance to be creativite and independent thinking. Furthermore, it improves research and communication skills and relieves the educational work of the teacher (Baird, 1991). Posters make students easier to learn the subject, it provides meaningful learning in teaching learning process. So that students' retention levels will increase and it will affect to students' academic achievement (Coskun & Eker, 2018).

Posters are commonly printed on paper. There is some limitation of paper-based poster that once a poster is printed, it will be impossible to make revision, correction

or adaptation on the product, whereas it is only possible to make soft file revision on a computer. Furthermore, it cost more money to print and the audience is limited by vision on certain places (D'Angelo, 2012). Besides, it is hard to compile the data and save it in long period of time. The digital interactive science poster is one of a platform that connecting poster to the cloud. The poster will digitally create, revise, save and share. It makes students easier to revise their work. In addition, it is not necessary to print their work because it means to be digitally shared and it can be access by audience online thus it is possible to gain significant number of audiences regardless of places, position or areas (Cook, Teaff, & Cook, 2015).

Digital Interactive Science Poster is new technique for presenting science topics in attractive way, offering easier access to the contents and clearer comprehension of the concept. The digital interactive science poster is made by using ThingLink. ThingLink is a free and easy-to-use digital tools that allows user to convert any image into an interactive graphic. It can create several "hot spots/icons" on certain parts of an image and turn that image into a multimedia launcher. We can add video, record audio, text, picture or provide any link to any website by clicking on a button. Easily incorporate an interactive graphic of ThingLink into any blog or website. ThingLink is an incredible tool that allowing users to pack a lot of content into small spaces (Oxnevad, 2012). According to Appasamy (2018), most students (80%) felt that creating ThingLink enhancing their understanding of the concept. The research also found that 77% of students felt ThingLink relatively easy to use and 80% of students felt that ThingLink assignment should be used in future classes as a learning and assessment tool (Appasamy, 2018). The implementation of digital interactive science poster provides students the opportunity to express their thinking, reaction, and idea through poster presentation. Poster presentation accommodate for different styles of learning and permit for personality preferences, students' creativity in poster design (El-Sakran & Prescott, 2013).

Digital interactive science poster possible to be used in any science topic. In this research, researcher is decided to focus on drugs topic. The number of drug abuse among students in 2018 (out of 13 provincial capitals in Indonesia) reach 2.29 million people (PUSLITDATIN, 2019). Based on the data of Riskesdas (2018), smoking prevalence in population ages 10 until 18 years old is 7.2% in 2013, 8.8%

in 2016 and 9.1% in 2018. The target of the government is to decrease to 5.4% in 2019. West Java is the province with the most smokers ages over ten years old in Indonesia with 32%. The proportion of alcoholic beverage consumption in population aged over 10 years old in Indonesia is 3.3% in Indonesia (RI, 2018). Based on the data above, drugs are very close to students' everyday life, it is very important to be learn by junior high school students as the next generation to be more aware of the effect of drugs.

Based on the facts that stated above, the researcher encouraged to do the research with title "The Effect of a Digital Interactive Science Poster Using ThingLink Towards Students' Concept Mastery and Creativity in Learning about Drugs".

1.2 Research Problem

The research problem of this study is "Is there any effect of digital interactive science poster using ThingLink towards students' concept mastery and creativity in learning about drugs?"

1.3 Research Question

Elaborating the research problem, the research attempts to explore the following questions.

1) How the effect of digital interactive science poster using ThingLink towards students' concept mastery in learning about drugs?
2) How the effect of digital interactive science poster using ThingLink towards students' creativity in learning about drugs?
3) How is students' impression after learning the concept of drugs by digital interactive science poster using ThingLink?

1.4 Limitation of Problem

This research is conducted to define the effect of digital interactive science poster using ThingLink in learning about drugs. The effect itself is referred to the improvement of students' concept mastery and profile of students' creativity. To know whether the students concept mastery is improved or not, researcher uses

SPSS to test the hypothesis and also uses normalized gain <g> by Hake (Hake, 1998). The students' concept mastery is assumed to be improved if the normalized gain is categorized as medium. Students' creativity is profiled from the product that the students made which is digital interactive science poster.

1.5 Research Objective

This research objective is specified as follow:

1) To investigate effect of digital interactive science poster using ThingLink towards students' concept mastery in learning about drugs.
2) To investigate effect of digital interactive science poster using ThingLink towards students' creativity in learning about drugs.
3) To identify students' impression after learning the concept of drugs by digital interactive science poster using ThingLink.

1.6 Research Benefit

The result of this study is expected to provide the following benefits:

1) Teacher

This research hopefully can provide teaching references about drugs by creating digital interactive science poster using ThingLink to evaluate the students' concept mastery and creativity.

2) Student

Students will increase their skill in using technology especially in making digital interactive science poster. Also, their creativity and concept mastery will develop, and students will also more interested in learning science.

3) Another researcher

This research provides the data completeness in the effect of digital interactive science poster using ThingLink toward students' creativity in learning drugs, which will enhance the next research about digital interactive science poster.

1.7 Organizational Structure of Research Paper

This research paper contains five chapters and several appendixes. Each chapter consists of sub-chapters. The systematic of this research paper is as follows:

1) Chapter 1: Introduction

This chapter contains the background of the research, research problem, research question, limitation of problem, research objective, research benefit and organizational structure of the research.

2) Chapter II: Literature Review

This chapter contain the literature review that describe about the digital interactive science poster, students' concept mastery, students' creativity, drugs and relevant research.

3) Chapter III: Research Methodology

This chapter contain the method that used in this research, which are research method, research design, population and sample, operational definition, assumption, hypothesis, research instrument, research procedure, instrument analysis result, and data processing technique.

4) Chapter IV: Result and Discussion

This chapter contains the result and the discussion of the research that analyzed and interpreted based on research question. The data of this research is presented in the form of tables and figures.

5) Chapter V: Conclusion and Recommendation

This chapter contains the conclusion of this research as well as the recommendation for future research.